

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

What is claimed is:

1. **(Presently Amended)** A method for collecting, assimilating and utilizing data from a variety of sources for determining the regulatory requirements and for generating the related compliance reports for a specific facility in a given ~~an~~ industry, the method comprising the steps of:

a. collecting data externally generated from data and unrelated to a specific facility but required for compliance requirements of a governmental compliance model;

b. collecting data uniquely associated with said facility and internally generated from said facility ~~from a user~~;

c. assimilating the external data and the ~~user~~ internal data in a processor to determine compliance by the user;

d. automatically generating a report based on the assimilation, which report is unique to the facility ~~user data and~~ containings the required governmental compliance information.

2. **(Presently Amended)** The method of claim 1, wherein the external data is collected via the Internet~~public data~~.

3. **(Original)** The method of claim 1, wherein the compliance model is a government

agency compliance requirement.

4. **(Original)** The method of claim 1, further including the step of electronically submitting the generated report to a relevant agency.

5. **(Original)** The method of claim 1, wherein the collected public data is industry specific.

6. **(Original)** The method of claim 1, wherein the collected user data is facility specific.

7. **(Original)** The method of claim 6, wherein the collected user data is equipment specific.

8. **(Original)** The method of claim 6, wherein the collected user data is location specific.

9. **(Original)** The method of claim 1, further including the step of creating a library of available data from the collected public data and non-confidential portions of the collected user data.

10. **(Original)** The method of claim 1, further including the steps of linking the public data to on-line databases and importing data from said databases into the collected public data.

11. **(Original)** The method of claim 1, wherein there is further included a mathematical database and wherein data in the collected public data and in the collected user data is imported into the mathematical database for calculating compliance data in the generation of a report.

12. **(Original)** The method of claim 11, wherein the mathematical database is an air module database for calculating hydrocarbon emissions from a crude oil storage tank.

13. **(Previously Amended)** The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating hydrocarbon emissions from storage tanks:

$$11 \text{ L T} = \text{L S} + \text{L W L S} = 365 \text{ V V W V K E K S V V} = 4$$

$$\text{D } 2 \text{ (H S - H L + H RO) W V} = \text{M V P VA RT LA T LA} = .044 \text{ T AA} + 0.56 \text{ T B} +$$

$$0.0079 \text{ aI T B} = \text{T AA} + 6 \text{ a} - 1 \text{ K E} = \text{dT V T LA} + \text{dP V} - \text{dP B P A} - \text{P VA dT V} = .072$$

$$\text{dT A} + 0.028 \text{ I K S} = 1 \text{ I} + 0.053 \text{ P VA H VO H VO} = \text{H S} - \text{H L} + \text{H RO L W} = 0.0010$$

$$\text{M V P VA QK N K P}$$

11 Symbol Name Description Type Source .pi. Pi Constant dimensionless Numeric
Mathematical constant factor = 3.1415 (given) a Tank paint Dimensionless empirical
Numeric Reference from Table solar absorb- factor which has been 12.3-7 in AP42 ence
factor established through reference and based on experience. color. Stored in System
Library. D Tank diameter Cross sectional linear Numeric Client data stored in
measurement of the System Database cylindrical tank. Units = linear H.sub.L Liquid
Height Average daily tank Numeric Client data stored in gauge reading which System

Database shows how much is in the tank. Units = linear (e.g. ft) H.sub.RO Roof Outage
Linear measurement Numeric Client data stored in of tank roof height System Database
measured from the vertical edge of the tank shell to the top of the dome or coned roof.
Units = linear (1) H.sub.S Shell Height Linear measurement of Numeric Client data
stored in tank height excluding System Database the height of the roof section of the
tank. Units = linear (1) H.sub.VO Vapor Space The height of the Numeric Result of
Equation Outage inside tank space 3.1.10 minus the liquid level in linear units, e.g. ft I
Daily solar Empirical factor based Numeric Referenced from Table insolation on tank
materials and 12.3-6 in AP42 factor conditions. Units = reference. Stored in
BTU/ft.sup.3-day System Library. K.sub.E Vapor space Dimensionless empirical
Numeric Result of Equation expansion factor used to calculate 3.1.7 factor standing
losses in Equation (1) K.sub.N Turnover Dimensionless empirical Numeric Taken from
Figure factor factor 12.3-6 in AP42 reference. Stored in System Library. K.sub.P
Working Dimensionless empirical Numeric Included by reference. loss factor which is
product Stored in System product specific, i.e. 0.75 for Library. factor crude oil and 1.0
for all other organic liquids. K.sub.S Vented Vapor Dimensionless factor Numeric Result
of Equation Saturation used to calculate 3.1.9 Factor the Standing Storage Losses.
L.sub.S Standing Hydrocarbon air emis- Numeric Result of Equation Losses sions from
crude and 3.1.2 condensate above ground storage tanks that are given off while the tank
is standing idle (not filling and emptying) and contains some quantity of fluid. Measured
in lbs/hr, lbs/day, and tons/year. L.sub.T Total Hydrocarbon air emissions Numeric
Result of Equation losses from crude and condensate 3.1.1 above ground storage tanks
that are a sum of the working and standing losses as described above. Measured in lbs/hr,

lbs/day, and tons/year. L.sub.W Working Hydrocarbon air emissions from Numeric
Result of Equation Losses crude and condensate above 3.1.11 ground storage tanks that
are given off during oper- ations (filling and emptying) and contains some quantity of
fluid. Measured in lbs/hr, lbs/day, and tons/year. Mv Vapor Molecular weight or the
Numeric Taken from reference Molecular weight of an Avogadro's tables in the AP42
Weight number of molecules of reference. Stored in the gases in the vapor System
Library. space volume. Units = mass/mole (e.g. lb/lb mole) P.sub.A Atmospheric
Standard ambient atmos- Numeric Constant by reference. pressure pheric pressure as
Stored in System measured via barometer, Library. e.g. 14.7 psia dP.sub.B Breather The
range in pressures Numeric Client data stored in vent tank vent or hatch will System
Database. pressure relieve under the Otherwise the program setting pressure of its
contents. will provide a default range. value if the user chooses. dPv Daily The range (or
change) Numeric Derived from FIG. vapor in the vapor pressure 12.3-1 and Table
pressure caused by the variance in 12.3-6 in AP42 range maximum and minimum daily
reference. Stored ambient temperatures. in System Library. Provided by reference in
pressure measurements. P.sub.VA Vapor True vapor pressure of Numeric Vapor sample
data pressure the liquid at the aver- stored in System age liquid surface temper- Database
or table in ature. Units = force/ AP42 reference stored unit area (f/l.sup.2) in System
Library. (lbs/inch.sup.2) Q Annual net The annual volume of hydrocarbons, Numeric
Client data stored in production e.g. crude oil, that is stored in the System Database
through-put tank being considered. This figure is taken from actual lease production
volumes. Volumetric units, e.g. bbls R Ideal Gas Ideal gas constant calculated as
Numeric Calculated from Constant (standard atmospheric pressure- constants/Almost

ideal molar volume of gas/mole- always used in USA as standard temperature) (e.g. psia-
10.731. Stored in ft.³/lb-mole- \cdot degree. R System Library. (Rankine) = 10.731)
dT_{sub.A} Daily average The difference between daily Numeric Taken from Table 12.3-
temperature minimum and maximum 6 in AP42 reference. range temperatures taken from
Table 12.3- Stored in System (\cdot degree. R \cdot degree. K) 6 as determined by regional
Library. location. T_{sub.AA} Daily average Average of daily maximum and Numeric
Table 12.3 in AP42 ambient minimum ambient temperatures. reference. Stored in
temperature Measured in \cdot degree. R or \cdot degree. K. System Library. T_{sub.B} Liquid bulk
Liquid bulk temperature at standard Numeric Result of Equation temperature temp Units
= \cdot degree. R or \cdot degree. K 3.1.6 T_{sub.LA} Daily average The average temperature
measured Numeric Result of Equation liquid surface at the surface of the liquid in the
3.1.5 temperature tank. In this case the temperature is calculated from ambient
temperatures rather than measured. Units = \cdot degree. R (Rankine) dT_v Daily vapor The
daily range in temperature of the Numeric Result of Equation temperature vapor in the
vapor space of the tank 3.1.8 range as described above; calculated. V_v Vapor space
Volumetric calculation of the Numeric Result of Equation volume average amount of
space in the tank 3.1.3 (overhead) that is not occupied by liquids. Measurement = l.^{sup.3}
W_v Vapor density Calculated density of the Numeric Result of Equation gases(vapors) in
the vapor space 3.1.4 calculated in equation (1)(a) Units = mass/unit volume (m/l.^{sup.3})
(e.g. lb/ft.^{sup.3})

14. **(Previously Amended)** The method of claim 12, wherein the mathematical database
includes the following primary calculation formulas for calculating hydrocarbon

emissions from internal combustion engines: $\sum_{i=1}^n EF_i \times g/hp/hr \times \text{Rated hp}_i \times 24 \text{ hrs/day} \times 365 \text{ days/year} \times 1 \text{ lb}/453.6 \text{ g} \times 1 \text{ ton}/2,000 \text{ lbs} =$
Emissions tons year

12 Symbol Name Description Type Source EF Emission The amount of an individual
Numeric Provided by the user or Factor pollutant that will be obtained from the g/hp/hr
generated per horse power equipment data base by hour of operation, e.g. the id number
or model 2.0 grams NO_x generated of compressor in grams per hp per hour. HP (hp)
Horse power The power rating of the Numeric Provided by the user or rating compressor
in horse obtained from the power per hour equipment data base by the id number or
model of compressor

15. **(Original)** The method of claim 14, whereing the primary formula is repeated for
each of the following pollutants:

13 NO_x Nitrous Nitrous oxide emissions Calculated from AP-42 emission factors or
Oxides manufacturers data. CO Carbon Carbon monoxide Calculated from AP-42
emission factors or Monoxide emissions manufacturers data. SO₂ Sulfur Sulfur
dioxide emissions Calculated from AP-42 emission factors or dioxide manufacturers
data. PA or Particulates Particulate emission from Calculated from AP-42 emission
factors or PM₁₀ fuel combustion manufacturers data. VOC_{nm} Non-methane
Measurement of emissions AP-42 emission factors or manufacturers data. Volatile of
VOC's as tons per year. Organic Compounds

16. **(Original)** The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating hydrocarbon emissions from external combustion units:
$$\sum_{i=1}^n \text{mm BTU}_i \text{ hr} \cdot \text{times. 1 SCF Fuel Heat Value in BTU} \cdot \text{times. EF lbs mm SCF} \cdot \text{times. 24 hrs day} \cdot \text{times. 365 days year} \cdot \text{times. 1 ton 2,000 lbs} = \text{Emissions tons year}$$

14 Symbol Name Description Type Source EF Emission Factor Amount of pollutant species Numeric Client data stored in lb/mm scf generated per unit of fuel used or System Database burned, e.g. lbs (pounds) per mm scf (Million standard cubic feet) of gas burned. mmbtu BTU rating of The size of the combustion unit as Numeric Client data stored in the unit measured in BTU's per hour. System Database mmbtu = million British Thermal Units

17. **(Original)** The method of claim 16, wherein the primary formula is repeated for each of the following pollutants:

15 NO_x Nitrous Nitrous oxide emissions Calculated from AP-42 emission factors or Oxides manufacturers data. CO Carbon Carbon monoxide Calculated from AP-42 emission factors or Monoxide emissions manufacturers data. SO₂ Sulfur Sulfur dioxide emissions Calculated from AP-42 emission factors or dioxide manufacturers data. PA or Particulates Particulate emission from Calculated from AP-42 emission factors or PM₁₀ fuel combustion manufacturers data. VOC_{nm} Non-methane

Measurement of emissions AP-42 emission factors or manufacturers data. Volatile of
VOC's as tons per year. Organic Compounds

18. **(Original)** The method of claim 12, wherein the mathematical database includes the
following primary calculation formulas for calculating emissions for valves, flanges
piping and compressor seals:
$$\sum_{i=1}^n EF_i \text{ lb/hr} \times \text{VOC \%} \times 24 \text{ hrs/day} \times 365 \text{ days/year} \times 1 \text{ ton} / 2,000 \text{ lbs} = \text{Emissions tons/year}$$

19. **(Previously Amended)** The method of claim 18, wherein the primary formula is
repeated for each fitting in each piece of equipment:

16 Symbol Name Description Type Source EF Emission Factor Amount of volatile
organic emissions Numeric Provided by generated per fugitive component or reference
from source. E.G. lbs/hour/source AP42 and SOCMI. No. of Number of Actual number of
each source Numeric Provided by the components, components component at the facility,
e.g. 355 user or obtained (src) valves, etc. from Client data stored in System Database or
equipment data stored in System Library VOC% VOC Concentration The concentration
of VOC (volatile Numeric Calculated from in the affected organic hydrocarbon
compounds) the gas analysis stream defined as any compound with C3+ for this facility.
hydrocarbons as identified in the gas analysis and as calculated by volume %.

20. **(Original)** The method of claim 18, wherein the mathematical database includes the
primary calculation formula for calculating emissions for glycol dehydration units,

wherein:

17 Symbol Name Description Type Source Unit Case name and case description Text
Provided by the user or Description used to retrieve case files from taken from the facility
data the GRI program. This name will also base as a facility name. be identified by a
facility ID number and an equipment ID number. Annual Hours Number of hours the unit
operates Numeric Input by user or user data of Operation annually, e.g 8760 hrs = 1 year
base. Gas Percentages of all components in the Numeric Gas analysis provided by
Composition gas stream. Individual values input and text user or from Client data
separately from gas analysis. stored in System Database mmscf/ Dry gas flow The
volumetric flow of the sales gas Numeric Production data from user day rate stream in
volumetric units per day (e.g. or Client data stored in mmscf/day or million standard
cubic System Database feet per day) lb/ Dry gas water The target final concentration of
water Numeric Client data stored in mmwscf content in the sales gas stream, in the USA
the System Database or default value is 7.0 lb/mmscf accepted by default Absorber
Number of actual equilibrium stages in Numeric Chosen by user stages the contactor;
may be chosen, if known, by the user as an alternative entry to the dry gas water content
described above. Lean TEG/ The pumping rate of the Numeric Client data stored in EG
flow rate lean or fresh tri-ethylene System Database glycol (or ethylene glycol) solution
in gallons per minute Water content The allowable water concentra- Numeric Client data
stored in tion in the lean or fresh glycol System Database or stream. A default value of
1.5% chosen by default may be chosen if the user does not have this value Re-circulation
The gallons of glycol solution Numeric Client data stored in ratio circulated per pound of

water System Database removed from the wet gas stream if known. May be chosen in place of the lean TEG/EG flow rate. Default value of 0.3 may be chosen in the program. Wet Gas Temperature of the incoming Numeric Client data stored in Temperature wet gas stream in .degree. F. System Database Wet gas Pressure of the incoming wet gas Numeric Client data stored in pressure stream in psig. System Database Glycol pump May be gas driven or electric Text Client data stored in type System Database ACFM/ Gas driven ACFM (air cubic feet per minute) gas/ Numeric Client data stored in gal pump volume gallon per minute glycol pumped (only System Database ratio for gas driven pumps) May choose default values of 0.03 for wet gas pressures greater than 40 psig and 0.08 for units with wet gas pressures less than 400 psig. Flash Tank Yes or no question. Is a flash tank Text Client data stored in involved with this unit. System Database Flash tank Operating temperature of the flash tank Numeric Client data stored in temperature if used in .degree. Fahrenheit (.degree. F.) System Database PSIG Flash tank Operating pressure of the flash tank if Numeric Client data stored in pressure used. Psig (pounds per square inch System Database gauge) Stripping gas Yes or no question. Is a gas stream Text Client data stored in option used to remove the hydrocarbons from System Database the glycol vent stream? Stripping gas Flow rate of the stripping gas stream, Numeric Client data stored in flow rate scfm System Database Control device Choose a control device as either a Text Client data stored in option vent condenser or vapor incinerator, or System Database choose no control device. Vent Operating temperature of the vent Numeric Client data stored in condenser condenser (if used) in .degree. F. System Database temperature Vent Operating pressure of the vent Numeric Client data stored in condenser condenser (if used) in absolute System Database pressure

pressure, e.g. psia Incinerator Average ambient air temperature for Numeric Selected from climatic ambient air the location in .degree. F. data stored in System temperature Library Excess oxygen % excess oxygen used in combustion Numeric Provided by the process if a vapor incinerator is chosen manufacturer of the as a control device. combustion unit and included in the System Library Combustion % efficiency of the vapor control Numeric Provided by the efficiency incinerator unit. manufacturer of the combustion unit and included in the equipment data base. VOCs Volatile Measurement of emissions of VOC's Numeric Glycalc .RTM. program output Organic as tons per year from the Glycalc Compounds Program Printout in tons/year HAPs Hazardous Air Volumetric measurement of a group of Numeric Glycalc .RTM. program output Pollutants air constituents that have been or information gained from determined by the Environmental the EPA speciation Protection Agency (EPA) to be program for HAP's. considered categorically hazardous to health and the human environment. Measured in tons/year

21. **(Previously Amended)** The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating flash emissions caused by the transfer of higher pressure liquids from a process vessel to a storage tank of less pressure: $\log R_{st} = 0.4896 - 4.9161 \log \gamma_{st} - \log \gamma_{st} + 3.496 \log \gamma_{st} + 1.501 \log P_{st} - 0.9213 \log T_{st}$ and the Vasquez Beggs GOR Correlation. $15 \text{ GOR} = C1 \cdot SG100 \cdot (P_{str} + P_{atm})^{C2} \cdot C3 \cdot \text{degree API } T_{\text{gas}} \cdot \text{degree F} + 460$ $SG100 = SG \cdot (1.0 + 5.912 \cdot 10^{-5} \cdot T_{\text{gas}} \cdot \text{degree F} \cdot \log P_{sep} + P_{atm})^{114.7}$

18 Symbol Name Description Type Source R.sub.st Stock Tank The ratio of the volume of gas Numeric Calculated by Black Gas Oil generated per barrel of oil produced as Oil GOR equation, Ratio (GOR) a result of the pressure drop between 3.6.1 the pressurized separator and the oil storage (stock) tank. Units = volume gas/volume oil, e.g standard cubic feet/barrel .gamma..sub.ost Stock Tank Measurement of the ratio of the weight Numeric Calculated using the Oil specific of the oil relative to water at standard physical data of the gravity temperature and pressure. E.g. units = materials being lb/gal per lb/gal or SG = 6.5 lb/gal oil/ stored 8.34 lb/gal water @ STP = 0.78 .gamma..sub.sp Separator Measurement of the ratio of the weight Numeric Calculated using the specific of the air relative to physical data of the gravity gas being measured P.sub.sp Separator The operating pressure of the vessel Numeric Measured at the pressure used to separate the oil, water and gas equipment by the in the produced fluid stream user T.sub.sp Separator The operating temperature of the Numeric Provided by the temperature separator measured in .degree. F. user from field measurements V.sub.MW Vapor The weight of one mole (or Numeric Determined by Molecular Avogadro's number of molecules) of reference or Weight the gas being measured. measurement. May use default value or actual gas analysis. C1, C2, Vasquez Constants calculated for the use in this Numeric Provided by C3 Beggs relationship using stastical empirical reference to the Constants data. Dimensionless relationship based on degree API gravity range of the crude being stored. SG Specific Same as .gamma..sub.sp or separator specific Numeric Calculated using the Gravity of gravity as described above. physical data of the the gas gas being measured SG100 Specific A calculated quantity based on the Numeric Result of equation

gravity of temperature and pressure measured at 3.6.3 the gas the separator referenced to 100 pounds referenced to per square inch gauge (psig) pressure. 100 psig P.sub.str Pressure Pressure of the fluid stream as it leaves Numeric Measured in the of the the separator or the separator pressure. field by the user. upstream fluid P.sub.atm Atmospheric The measured pressure of ambient Numeric Measured at the pressure conditions or in the atmosphere outside field location using the separator. a barometer or by default at ST&P. T.sub.gas Gas temperature at The measured temperature of the gas Numeric Measured at the the separator stream in the separator field location by the user. P.sub.sep Separator Pressure The operating pressure of the separator Numeric Measured at the measured in psig field location by the user. psig Pounds per square Pressure measurement in units of Numeric Measured with a inch gauge pounds per square inch or in general pressure measuring units-f/l.sup.2. device at the equipment site. .degree. API Degrees API gravity The measured API gravity of the fluid Numeric Calculated using the (crude) being measured as calculated physical data of the by a standard equation which ratios the fluid. specific gravity of the fluid to a referenced standard. .degree. F. Degrees Fahrenheit The standard temperature measurement Numeric Standard unit using degrees Fahrenheit as a scale. log Logarithm Mathematical relationship which Text Standard unit equals the exponent value that the number 10 would be raised to get that same number.

22. **(Original)** The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating loading loss emissions: $16 L L = 12.46 SPM T$

19 Symbol Name Description Type Source L.sub.L Loading losses- The Volatile Organic
Numeric Result of equation VOC Compound (VOC) 3.7.1 emissions quantity as
determined in the above equation. S Saturation Empirical quantity for Numeric AP-42
reference Table factor calculation 5.2-1. Stored in System Library. P True liquid The true
vapor pressure of Numeric By reference from vapor pressure of the liquid being loaded
AP-42 FIG. 7.1-5, the liquid being which is the pressure at 7.1-6, 7.1-2. Stored in loaded
which the liquid is in System Library. equilibrium with the overhead vapors. Measured in
pounds per square inch atmospheric (psia) M Vapor The weight per mole of Numeric By
reference from Molecular gases being emitted, e.g AP-42 Table 7.1-2. Weight lb/lb mole.
One mole = Stored in System weight of 10.sup.23 molecules Library. (Avogadro's
number) of the gas or 359 standard cubic feet. (SCF) T Bulk The temperature of the
Numeric Supplied from the Liquid liquid being loaded in .degree.R tank calculation data.
Temperature (Rankine) = .degree.F. + 460.

23. **(Original)** The method of claim 12, wherein the mathematical database includes the
following primary calculation formulas for calculating emission fees: 17 Emissions tons
year .times. \$ per ton = Annual Emissions Fee

20 Symbol Name Description Type Source \$ Price per ton The dollar price per tons of
Numeric Established by law emissions as established by the particular state of operation
NOx Nitrous Oxides Nitrous oxide emissions Numeric Calculated CO Carbon Carbon
monoxide emissions Numeric Calculated Monoxide SO.sub.2 Sulfur dioxide Sulfur
dioxide emissions Numeric Calculated PA or PM.sub.10 Particulates Particulate emission

from fuel Numeric Calculated combustion VOCs Volatile Organic VOC emissions

Numeric Calculated Compounds